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Lining element for the interior of a vehicle

Description

The invention relates to a lining element for the interior of a vehicle, in particular a motor vehicle, having a base part which, on its surface side facing the interior of the vehicle and suitable for emitting light, is provided with a translucent covering layer.

Prior art

DE 198 22 425 C1 discloses a lining part of the generic type for use in the interior of a motor vehicle. It comprises a transparent, light-conducting base part which, on the side of the interior, is equipped with a covering layer of natural stone. The natural stone is cut sufficiently thinly to permit the passage of light in order to achieve an optical effect and is joined to the base part by means of an adhesive. As an option, the covering layer can also be provided with a tacky clear varnish which, in the event of a fracture of the natural stone caused by an accident, prevents splinters flying about.

This rather exotic construction can naturally more likely be used in small, in particular narrow, components, for example decorative strips.

As a result of the materials used on the side of the interior, lining parts of this kind have a hard surface with a correspondingly unpleasant feel.

Furthermore, in the document DE 198 45 100 A1 a lining part is also disclosed which has an elastomeric,

possibly also transparent, external material which is let into a receptacle in the base part with a form fit. In order to achieve optical effects, an illumination device can be embedded in the external material.

In this construction, although a pleasing feel can be produced, the optical impression is unsatisfactory because of the locally different intensity of light.

Object

The invention is based on the object of providing an optically and haptically pleasing lining part, which can also be formed with a large area, having a light-emitting surface.

Achievement

According to the invention, the object is achieved in that the covering layer is designed to be elastically compressible.

The covering layer is preferably designed to be translucent, its optical transmissivity in the visible spectral range (380 nm to 780 nm, usually measured at 550 nm) being 1 to 25%, in particular 5 to 10%.

According to a particular embodiment of the invention, the base part is designed as a plate-like optical conductor which is operationally associated with an illumination device, for example an incandescent lamp or a light-emitting diode (LED). The optical conductor preferably consists of a transparent plastic, in particular PMMA or PC, and has a structure by means of which it is possible to bring about an output of light on the surface side of the optical conductor facing the interior. Structures of this type can be produced, for example, by means of laser removal or a treatment by means of sandblasting on the surface of the optical

conductor, but can also be produced by structuring the mold for injection molding or in the printing process. Depending on the selected formation, the structure can be arranged on one of the two or even both the surface sides or, if appropriate, even within the optical conductor.

Alternatively, provision can be made for the plate-like base part to be formed directly as a light generator and, for example, to comprise an electroluminescent film (EL film). EL films are light-emitting films which can be cut and deformed three-dimensionally and which, as Lambert radiators, as they are known, emit virtually monochromatic light which is uniform in any viewing direction and extends from blue to yellow (480 nm to 580 nm) and also mixed colors thereof, for example white. In principle, however, other flat light emitters, for example OLEDs (organic light-emitting diodes) or polyLEDs, can also be used.

The translucent, elastically compressible covering layer preferably consists of an elastomer, in particular EPDM, silicone or polyurethane which, over its entire thickness or else only partially, has a foam structure that reduces its hardness. The elastomer advantageously has a hardness of 20 to 70 Shore A at room temperature, in particular about 40 Shore A, in order to impart to the lining element overall a pleasing feel under the atmospheric conditions prevailing in the interior of the vehicle.

According to another embodiment of the invention, the covering layer comprises a layer covered toward the interior by means of a film and made of a gel-like substance which, at room temperature, preferably has a dynamic viscosity of 0.01 to 10 Pa·s, in particular 0.1 to 1 Pa·s (like honey) and, under local pressure (touching the surface of the lining element on the side

of the interior) escapes to the side in a viscid manner into the remaining gel-filled gap underneath the film.

The gel-like substance is preferably arranged between two films and, in this form, can be adhesively bonded to the flat base part. The film on the side of the interior must firstly have a relatively low thickness, in order in turn not to increase the stiffness of the covering layer excessively, but secondly must have sufficient strength. For instance, polyurethane films with a thickness of 0.1 to 1.5 mm, in particular of 0.5 to 1.0 mm, are suitable.

The thickness of the covering layer overall is preferably 1.0 to 5.0 mm, in particular 2.0 mm to 3.0 mm, so that their edges can be provided with visible and palpable curves which optimize the overall impression of the lining element.

Figures

The figures illustrate exemplary and schematically different embodiments of the invention.

Fig. 1 shows a lining part according to a first embodiment of the invention in longitudinal section

Fig. 2 shows a longitudinal section through a further lining element according to the invention

The lining element 1 illustrated in fig. 1 comprises a base part 2 having a thickness D_1 and a covering layer 3 having a thickness D_2. The base part 2 is formed as an injection molding made from a transparent plastic having a structured surface 5 facing the interior 4 of the vehicle. Via an integrally molded lateral optical channel 6 (alternatively also by means of a glass fiber

optical conductor), the light generated in a separate light generator 7 in the form of a light-emitting diode 8 (illustrated schematically by the arrows A) is fed by means of a deflection zone 9 provided with mirrored surfaces and formed in the manner of a staircase into the level, flat optical conductor 10 of the base part 2, where it is distributed over the surface of the lining element 1.

Via the structured surface 5, the light enters the covering layer 3, which consists of a translucent elastomer and is adhesively bonded to the base part 2 by means of a transparent adhesive 11. The covering layer 3 has two outer layers 12, 13 of compact material and a foamed core layer 14 of foamed material, which extends parallel to the structured surface 5 of the base part 2. The foamed core layer 14 firstly increases the compressibility of the covering layer 3 and, furthermore, makes the passage of light more uniform by means of scattering. The lining element 1 thus has a uniform emergence of light and a pleasing feel, since the covering layer 3 can be deformed elastically compressibly under the pressure of a touch (arrow B). Rounded edges 15 on the part of the covering layer 3 that projects beyond the edging 16 of the lining element 1 reinforce the positive impression once more if they are touched.

In the embodiment according to fig. 2, the base part 2 comprises a flat carrier 17, which can be designed as desired with regard to its optical properties and which, on its surface side facing the interior 4 of the vehicle, is equipped with a light generator 7 in the form of an electroluminescent film 18. The latter generates light which enters the covering layer 3 directly very uniformly in the direction of the arrows A.

The translucent covering layer 3 for its part comprises an upper and a lower translucent, flexible plastic film 19, 20, which are joined tightly to each other at the edges. The interspace between the plastic films 19, 20 is filled with a turbid, gel-like substance 21, which escapes laterally (arrow C) in a viscid manner under pressure (arrow B) on the surface of the covering layer 3 that faces the interior.

Irrespective of the embodiment selected, the covering layer 3 acts in a translucent manner overall with an optical transmissivity in the visible spectral range of 1 to 25%, in particular 5 to 10%. This translucency is firstly sufficient in order still to emit a noticeable amount of light from the light generator 7 into the interior 4 of the vehicle and, secondly, still leads to an extraordinarily uniform emission of light being achieved which is pleasantly glare-free even in darkness. Furthermore, it is possible to provide the covering layer 3 additionally with a translucent textile covering, if the desired translucency is maintained overall. It is likewise possible to produce this by means of the application of a thin opaque layer to an intrinsically transparent base body.

The lining element according to the invention can in principle be designed in any desired shape and size, for example even as three-dimensionally shaped roof linings, door cladding, pillar cladding, sun visor or rear cladding of the backrest of a vehicle seat. By means of the illumination, a pleasant ambience can be created in the entire interior of the vehicle but the lining element can be used in the form of an orientation light or in conjunction with operating elements.

Reference symbols

1	Lining element
2	Base part
3	Covering layer
4	Interior of the vehicle
5	Structured surface
6	Optical channel
7	Light generator
8	Light-emitting diode
9	Deflection zone
10	Optical conductor
11	Adhesive
12, 13	Outer layer
14	Core layer
15	Edge
16	Edging
17	Carrier
18	Electroluminescent film
19, 20	Plastic film
21	Gel-like substance
D_1	Thickness of base part
D_2	Thickness of covering layer
A	Arrow (beam path of light)
B	Arrow (pressure when touched)
C	Arrow (escaping gel-like substance)